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ABSTRACT

This document is a partially annotated bibliography of publications of the Learning Research and Development Center of the University of Pittsburgh. The sections of the bibliography are: Publications: 1972 (annotated); Publications: 1971 (annotated); Reprints: 1964-1970 (partially annotated); Working Papers: 1965-1970 (partially annotated); Technical Reports: 1966-1970; Monographs: 1970 (one of the two is annotated); and a listing of 1964-1972 Publications by Author. (DB)

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CONTENTS

PUBLICATIONS: 1972

PUBLICATIONS: 1971

REPRINTS: 1964-1970

WORKING PAPERS: 1965-1970

TECHNICAL REPORTS: 1966-1970

MONOGRAPHS: 1970

1964-1972 PUBLICATIONS BY AUTHOR

PUBLICATIONS: 1972

1972/1. "Criterion-Referenced Testing in the Context of Instruction." Anthony J. Nitko. 18 pp. [50¢]
A distinction is made between criterion-referenced scores, norm-referenced scores, cut-off scores, criterion scores, criterion variables, and content-standard scores. The relationship between norm-referenced and criterion-referenced information is considered. The need for construct validation studies of criterion-referenced tests is pointed out. The use of criterion-referenced testing in instruction is considered in terms of absolute interpretations and mastery learning. Whether criterion-referenced and/or norm-referenced testing is needed to make instructional decisions depends upon the instructional context. For purposes of instruction and instructional decision-making, there is a need for the integration of measurement knowledge with knowledge about instructional psychology. The intended audience includes educational measurement specialists, and curriculum and instructional developers and evaluators.

1972/2. "Facilitation of Discrimination Learning with Delayed Reinforcement." Sondra Blevins Goldstein and Alexander W. Siegel. 12 pp. [50¢] Subsequently published in Child Development, 1972, 43(3), 1004-1011.
Eighty-four nine-year-old children, twelve in each of seven experimental groups, learned a two-choice successive discrimination problem. The parameters that were systematically manipulated included: immediate vs. delayed reinforcement, forced preresponse stimulus exposure vs. stimulus exposure during the delay interval, intertrial and interstimulus intervals. The typical decrement in performance found under delayed reinforcement was obtained only when: (1) no preresponse exposure was required, and (2) when the discriminative stimuli were absent from S's view during the delay of reinforcement period. Results are discussed within the framework of perceptual learning theory. Experimental child psychologists are the intended audience.

1972/3. "Alternative Uses of Phonemic Information in Spelling." Dorothea P. Simon and Herbert A. Simon. 33 pp. [50¢] To appear in the Review of Educational Research.
The paper distinguishes several ways in which phonemic information can be employed in spelling, examines some empirical data on the consequences of using different information sources, formulates hypotheses about the underlying processes, and draws implications for the teaching (and learning) of spelling. A computer program is constructed to simulate spelling processes that use phonemic information. The performance of the program is analyzed, and its behavior compared and contrasted with a rule-table algorithm. The program is shown to give a plausible account of the causes for children's most common spelling errors. Language arts curriculum designers and anyone concerned with the learning process will find this paper of interest. (ED 063 295)

1972/4. "The Rationale and Design of a Primary Grades Reading System for an Individualized Classroom." Isabel L. Beck and Donna D. Mitroff. 89 pp. [$1]
This monograph presents the rationale and design of The New Primary Grades Reading System (NRS) presently under development. NRS uses a code-breaking approach which is characterized as an eclectic, phonic approach based on linguistic principles. NRS is an individualized adaptive system. To enable children to engage in reading situations that resemble real-world situations, NRS designers

have developed three categories of materials. The first, the prescriptive category, is essentially controlled by the teacher. The second, the selection category, affords the student the opportunity to select one of two activities. And the third, the choice category, allows him to choose from a variety of materials and activities. The monograph is written for individuals interested in instruction, particularly reading instruction. (ED 063 100)

1972/5. "Planning for Evaluation of the LRDC Instructional Model." Paul R. Lohnes. 102 pp. [$1.50]
This monograph describes past Center work related to the problem of evaluation and suggests new directions for the evaluation of Center-developed instructional materials and procedures. Evaluative research, like any research, must have organizing ideas (theories) if it is to be maximally useful. To contribute to meeting this need, a theory of educational criteria is suggested, the importance of assessing the degree of implementation of new educational programs is pointed out, and a model is proposed for combining information on student entering behaviors, educational treatments, and resulting student achievement. The intended audience includes evaluation experts, as well as educators with an interest in evaluation problems.

1972/6. "Instructional Psychology." Robert Glaser and Lauren B. Resnick. In Paul H. Mussen and Mark R. Rosenzweig (Eds.), Annual Review of Psychology. Vol. 23. Palo Alto, California: Annual Reviews, 1972. Pp. 207-276. [Available at $1 per copy from Annual Reviews Inc., 4139 El Camino Way, Palo Alto, California 94306.]
In recent years, psychologists and others interested in learning and development have become increasingly involved with questions heretofore the preserve of educational psychology. The interest of these groups portends a change in the nature of psychological concern for the educational process. The field emerging from this trend has been called "instructional psychology." This review identifies areas of work and emerging issues that characterize this new field. The components of a potential theory for the optimization of learning appear to be the following: (1) analysis of the task properties of a knowledge domain, (2) diagnosis of learner characteristics, (3) design of the instructional environment, (4) assessment of specific instructional effects, and (5) evaluation of generalized learning outcomes. This review concentrates on the first three of these concerns. Its major sections deal with the analysis of tasks, early education, instruction in Piagetian concepts, learning and individual differences, behavior modification, and learning from written prose. The review will be of interest to experimental, developmental, social, and educational psychologists, as well as to instructional designers and educators.

1972/7. "The Development and Validation of an Individualized Perceptual Skills Curriculum." Jerome Rosner. 113 pp. [$1.50]
The goals of the Perceptual Skills Curriculum Project were: (1) identify those perceptual skills that appear to be directly related to the basic classroom tasks of reading and arithmetic at the primary level; (2) given identified perceptual skills that do relate directly to classroom achievement, determine whether such skills can be trained effectively; (3) given trainable skills that are relevant to classroom achievement, determine whether the effect of that training can be

measured in the classroom behaviors. In other words, can transfer be effected?; and (4) given affirmative responses to all of the above, describe the training in a way that will allow it to be implemented and managed in the classroom of a public school, as a Perceptual Skills Curriculum. To a large degree, these goals have been achieved. The purpose of this paper is to describe the methods employed, the information gathered, and the outcomes to date. The intended audience includes educators, psychologists, and others concerned with the relationship between perceptual skills and academic performance. (ED 062 731)

1972/8. "Reflectivity as an Influence on Focussing Behavior of Children." William Nuessle and Alexander W. Siegel. 19 pp. [50¢] Subsequently published in the Journal of Experimental Child Psychology, 1972, 14(2), 265-276.
The study reported here investigated the influence of reflective and impulsive problem-solving styles on the information-processing proficiency (focussing) of fifth- and ninth-grade boys and girls using a concept identification procedure developed by Levine. It was concluded that developmental differences in focussing are strongly related to developmental differences in reflection-impulsivity. An examination of Levine's task revealed the likelihood that a reflective-cognitive style facilitates focussing because it allows for more effective search for and retrieval of stored information. The intended audience consists of experimental child psychologists.

1972/9. "Criterion-Referenced Measurement: An Annotated Bibliography." Tse-chi Hsu and M. Elizabeth Boston. 20 pp. [50¢]
This bibliography represents a first attempt at assembling and annotating published and unpublished papers and articles dealing with criterion-referenced measurement. It should be of interest to anyone working in measurement, individualized instruction, or accountability.

1972/10. "Hierarchies in Children's Learning." Lauren B. Resnick, Editor. 114 pp. [$1.50]
This monograph reports the proceedings of a symposium that considered issues in the use of learning hierarchies in both psychological and educational research. The opening paper by Lauren B. Resnick presents a brief overview of research on learning hierarchies. In the succeeding papers by Margaret C. Wang, A. Edward Uprichard, Alexander W. Siegel and Esther Kresh, and Virginia K. Wiegand, four instances of research on hierarchies are presented, each representing a different approach to the problem of hypothesizing and testing hierarchical relations among cognitive tasks. The discussants, John B. Carroll, Robert Glaser, and Millie Almy, then consider implications of the research reported. The intended audience consists of psychologists, educational researchers, and curriculum designers. (ED 064 668)

1972/11. "A Review of Selected Publications on Behavioral Objectives." C. Mauritz Lindvall. Journal of Educational Measurement, 1972, 9(1), 75-81. [50¢]
Six books on the general topic of how to use carefully predefined outcomes to improve instruction are reviewed. The intended audience includes professional educators and instructional designers and evaluators.

1972/12. "Pronominalization: A Device for Unifying Sentences in Memory." Alan M. Lesgold. Journal of Verbal Learning and Verbal Behavior, 1972, 11(3), 316-323. [50¢]

This paper describes a study in which memory representations (interword probe recall probabilities) were examined for sentences whose propositions were or were not related by pronominal reference. Sentences were compared that had similar syntactic structures or similar semantic structures. In both types, pronominal reference resulted in completely integrated memory representations. Substitution of another noun or repeating the same noun resulted in incomplete integration. Pronominal reference is proposed to function as a flag to mark portions of linguistic input that can be stored as a single memory unit. The paper will be interest primarily to psychologists of language.

1972/13. "Individuals and Learning: The New Aptitudes." Robert Glaser. Educational Researcher, 1972, 1(6), 5-13. [50¢]
In this paper, the author shows how certain developments in psychology have influenced present educational methods and how recent work in learning theory, developmental psychology, and psychometrics strongly suggests new directions for educational research and practice. He discusses this theme in the context of a central problem in education--adapting educational environments to individual differences. This paper was the author's Presidential Address at the 1972 annual meetings of the American Educational Research Association. The intended audience includes experimental, developmental, social, and educational psychologists, as well as instructional designers and educators.

1972/14. "Control of a Continuous Response Dimension by a Continuous Stimulus Dimension." Donald G. Wildemann and James G. Holland. 29 pp. [50¢] Subsequently published in the Journal of the Experimental Analysis of Behavior, 1972, 18(3), 419-434.
A study is described in which subjects were trained to respond to stimuli from a continuous stimulus dimension (tonal frequency) with response values from a continuous response dimension. The results suggested that if there are fast and efficient methods to obtain control of a continuous response dimension by a continuous stimulus dimension, these methods must depend on factors other than simple generalization. Individuals interested in basic learning research and its application are the intended audience.

1972/15. "The Effect of the Blackout Method on Acquisition and Generalization." Donald G. Wildemann and James G. Holland. 17 pp. [50¢] Subsequently published in the Journal of the Experimental Analysis of Behavior, 1973, 19(1), 73-80.
In the experiment reported in this paper, stimulus generalization along a stimulus dimension was measured following discrimination training with the Lyons blackout method. For comparison, generalization was also measured following reinforced responding to the positive stimulus without discrimination training, and following discrimination training by extinction of pecks to the negative stimulus. The results suggested that following discrimination training in which the positive and negative stimuli are on the same continuum, the blackout method produces extinction-like effects on generalization tests. The intended audience consists of individuals interested in basic learning research and its application.

1972/16. "The Effects of a Systematic Manipulation of Contingencies upon Overt Work Behavior in a Primary Classroom." Roger D. Klein, Aubrey H. Roden, J. Ronald Gentile, Lauren B. Resnick, Larry J. Reynolds, and Barbara Bachmeyer. 21 pp. [50¢]

The study reported here was aimed at modifying the on-task and task completion rates of three kindergarten children by altering the contingencies of reinforcement associated with these two work behaviors. Increased teacher attention was found to produce reliable increases in on-task rate over the baseline condition. These increases were maintained when the contingencies were reduced but additional significant increases did not occur. The on-task rate of the entire class changed reliably during all experimental manipulations but no functional relationships were established. Task completion rates did not respond systematically to changes in the experimental conditions. The paper is written primarily for researchers and practitioners in the area of classroom behavior modification.

1972/17. "Effects of Pronouns on Children's Memory for Sentences." Alan M. Lesgold. 17 pp. [50¢]
In the study reported in this paper, children, eight to ten years old, were quite able to comprehend personal pronouns. However, they did not remember sentences whose propositions were linked by pronouns in the integrated manner that adults do. Integration was found only with a few, very vivid sentences. When the sentence subjects were repeated rather than pronominalized, the sentences were uniformly not integrated in memory. Children's inability to integrate sentence memory representations was attributed to short-term memory limitations that prevented successful anaphora resolution. The intended audience includes developmental psychologists and psycholinguists.

1972/18. "Test Project for the LRDC Beginning Reading Program 'Stepping Stones to Reading'." Helen M. Popp. 85 pp. [$1]
This report presents the results of a project designed to field test a newly developed beginning reading program. One of the features of this program is that vowels are "color-coded" so that different spellings of the same sound maintain some feature in common. The purposes of the field test were to compare standard and reduced color versions of the program to determine how well individual elements in the program are learned, and to investigate the adequacy of the program for teaching the use of syntactic and semantic cues for reading words containing elements not yet taught. The data provide support for the original philosophy and theory underlying the reading system and suggest revisions that would increase the effectiveness of the procedures employed. The report should be of interest to researchers and curriculum designers concerned with beginning reading instruction.

1972/19. "Visual and Haptic Dimensional Dominance: The Effects of Novelty." Alexander W. Siegel and John C. Barber. 20 pp. [50¢]
Described in this paper is a study in which 108 preschool, kindergarten, and first-grade children were given tests of dimensional dominance with planometric stimuli in either the visual or haptic modality. The visual dimensions were form and color; the haptic dimensions, form and texture. The results indicated that the shift to form dominance occurred relatively later in the haptic modality (first grade) than in the visual modality (kindergarten). The effects of the novelty manipulation were opposite in the two modalities. Visually, introduction of novel color cues with familiar forms produced the greatest shift towards color dominance; haptically, introduction of novel form cues produced the greatest shift towards texture dominance. This paper is written primarily for experimental child psychologists.

1972/20. "Open Education: Some Tasks for Technology." Lauren B. Resnick. 26 pp. [50¢] Also published in Educational Technology, 1972, 12(1), 70-76.
This paper discusses the implications of learner-controlled educational systems for the future development of educational methods and techniques. Specifically, the implications of learner control are discussed for six aspects of educational systems: (1) the choice and definition of educational objectives; (2) the organization and sequencing of objectives, i.e., the design of curricula; (3) the problem of displaying educational alternatives to the learner; (4) the provision of learner control within a given instructional episode; (5) learner control of motivation; and (6) the evaluation of competence. The paper will be of interest to individuals engaged in educational research and development.

1972/21. "Psychosemantics: Some Cognitive Aspects of Structural Meaning." Charles A. Perfetti. Psychological Bulletin, 1972, 78(4), 241-259. [50¢]
Aspects of semantic structure that have significance for cognitive psychology are discussed. On the one hand, there are developments within the framework of transformational grammar that provide a semantic conception of syntactic relations. On the other hand, there is the structure of lexical meaning, especially the idea of semantic features as components of lexical meaning. While the theoretical status of semantic features is presently weak, there is some evidence that such components function in long-term memory. However, in addition to methodological problems, limitations on semantic features, as they have been previously conceived, are suggested by the possibility of semantic deep structure and the requirements of referential processes. The intended audience consists of psychologists and linguists.

1972/22. "Encoding Uniqueness and the Imagery Mnemonic in Associative Learning." Alan M. Lesgold and Susan R. Goldman. 25 pp. [50¢] To appear in the Journal of Verbal Learning and Verbal Behavior.
In the study reported in this paper, subjects generated and wrote descriptions of interactive images for triplets of concrete nouns. This was followed by a surprise cued recognition or cued recall test. Uniqueness of the imagined relationship between the cues and the other items was operationally defined and shown to be very highly correlated with memory performance. Uniqueness may be the critical component of the bizarreness prescribed in the ancient imagery mnemonics. The paper is intended primarily for psychologists interested in memory and cognition.

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PUBLICATIONS: 1971

1971/1. "Strategies in Computer-Assisted Instruction: A Selective Overview." Karen K. Block. 44 pp. [50¢]
Several major CAI projects in the country are reviewed. Special attention is given to the nature of the instructional strategies used in these projects, and CAI development work at LRDC is placed in this context. Portions of this monograph are included in Volume V of The Encyclopedia of Library and Information Sciences edited by Alan Kent (New York: Marcel Dekker, Inc., 1971). The monograph is written for professional educators and psychologists. (ED 049 614)

1971/2. "IMP The LRDC Integrated Macro Package." Robert J. Fitzhugh and Martin M. Chadwick. 100 pp. [$1.50]
An extensive package of macro functions which can be called by programmers writing in assembly language is described. Given a good macro assembler of the type available on many computers, IMP illustrates how it is possible to provide a significant programming aid without becoming involved in the problems of compiler writing. The package can be as extensive or as limited as is desired and can be tailored to meet specific application or configuration requirements. This IMP solution would seem to be appropriate for many laboratory installations with smaller computers and applications for which there are no suitable higher level languages available. (ED 049 613)

1971/3. "The Auditory Analysis Test: An Initial Report." Jerome Rosner and Dorothea P. Simon. 22 pp. [50¢] Subsequently published in the Journal of Learning Disabilities, 1971, 4(7), 384-392.
A new test of auditory perception based on phonic analysis tasks is described. Significant correlations (from .53 to .84) with grades 1-6 reading scores are reported along with an analysis of test item difficulty. Implications of the data are discussed as they might relate to teachers, curriculum designers, and others concerned with individual differences in the perceptual aptitudes of children. (ED 051 253)

1971/4. "The Effects of Delay and Difficulty on Discrimination Learning and Stimulus Generalization." Donald G. Wildemann and James G. Holland. Psychonomic Science, 1971, 22(5), 307-308. [50¢]
Following training on an easy size discrimination, pigeons were matched on the basis of stimulus control by the positive stimulus following generalization tests. Three Ss were immediately retrained on a more difficult discrimination along the same dimension, while the remaining three Ss were retrained after a six-month delay. The six month delay group took longer to learn the more difficult discrimination and displayed less stimulus control on a subsequent generalization test. The intended audience consists of individuals interested in basic learning research and its application. (ED 049 490)

1971/5. "The Effect of Time Outs to S- Approaches on Transposition and Peak Shift." Donald G. Wildemann and James G. Holland. 26 pp. [50¢]
Relational responding and peak shift were found to be related. In two experiments, pigeons were trained to make a successive discrimination by either the blackout method of errorless learning or training with extinction. In experiment 1, pigeons trained with extinction learned a circle-size discrimination more quickly than

pigeons trained with the blackout technique. In experiment 2, the results of experiment 1 were confirmed with a more difficult discrimination and the blackout technique was found to produce both peak shift and relational responding in some subjects. The results were tentatively related to Terrace's analysis of discrimination learning. The intended audience consists of individuals interested in basic learning research and its application. (ED 049 491)

1971/6. "The Sequence of Development of Some Early Mathematics Behaviors." Margaret C. Wang, Lauren B. Resnick, and Robert F. Boozer. Child Development, 1971, 42(6), 1767-1778. [50¢]
This paper reports one of a series of curriculum validation and early learning studies. It will be of particular interest to child psychologists and early curriculum designers. (ED 052 947)

1971/7. "The Design Board Program." Jerome Rosner. 23 pp. [50¢]
This paper describes a visual-motor training program that has been implemented successfully with 3- to 11-year-old children. A hierarchy of objectives and criterion-referenced tests are presented along with instructional methods. Validation studies are cited and described briefly. The paper will be of interest to child psychologists and teachers working in early learning programs. (ED 050 182)

1971/8. "Computer Assistance for Individualizing Measurement." Richard L. Ferguson. 81 pp. [$1]
This report is a follow-up and elaboration of an earlier report published under the title "A Model for Computer-Assisted Criterion-Referenced Measurement" in Education, 1970, 81(1), 25-31. It is based on new data analyses and provides a substantially more detailed description of the procedures used. It further offers some description of the sequential test models to be used in the Individually Prescribed Instruction mathematics program. The intended audience consists of measurement specialists and persons interested in computer applications in individualizing education.

1971/9. "Measurement in Learning and Instruction." Robert Glaser and Anthony J. Nitko. In Robert L. Thorndike (Ed.), Educational Measurement. Washington, D.C.: American Council on Education, 1971. Pp. 625-670. [50¢]
This chapter initially considers three classes of instructional models found in current educational practice. One model--a general model for adapting instruction to individual differences--is described, and its measurement implications are discussed. Central to this approach are the specification of instructional goals in terms of domains of performance criteria and the adaptation of instruction on an individual basis so that these goals are attained by a maximum number of students. The description of instructional models is followed by considerations of the analysis of performance domains, individual assignment to instructional alternatives, and the necessity for measuring what is learned by means of criterion-referenced tests. The final section of the chapter briefly discusses the evaluation and improvement of an instructional system. The intended audience includes educational measurement specialists, and curriculum and instructional developers and evaluators.

1971/10. "Perceptual Skills—A Concern of the Classroom Teacher?" Jerome Rosner. The Reading Teacher, 1971, 24(6), 543-549. [50¢]

This article attempts to state clearly the relationship between perceptual skills and classroom performance. The identification of perceptual strengths and deficits is discussed. Acknowledging that resources for habilitative training are not always available, the article advises teachers that effective instruction can be effected if certain guidelines are followed. Suggestions are included for methods of teaching to the child's deficits through his strengths.

1971/11. "Methodological Considerations in On-Line Contingent Research and Implications for Learning." Marna Cupp Whittington. 49 pp. [50¢]
This report describes methods for the implementation of on-line contingent research in the learning laboratory. The manner in which contingent research designs enable the researcher to examine learning problems that are analogous to the problems of instructional technology is demonstrated, with particular emphasis placed on the implications of contingent research techniques for task management, psychological measurement, and research design. A systematic analysis of contingent decision algorithms and on-line programs is presented, and the application of these programs is examined and compared with non-contingent research designs with respect to procedure, data collection, and efficiency. The report is written for educators and psychologists interested in on-line contingent research.

1971/12. "Application of the IPI Model to a Perceptual Development Curriculum." Jerome Rosner. In John I. Arena (Ed.), Meeting Total Needs of Learning-Disabled Children: A Forward Look. Proceedings of the Seventh Annual International Conference of the Association for Children with Learning Disabilities. San Rafael, California: Academic Therapy Publications, 1971. Pp. 95-107. [50¢]
This paper describes how the Individually Prescribed Instruction (IPI) model for individualization was applied to a perceptual skills curriculum. The rationale for its use is presented as are examples of application. The discussion should be of interest to teachers of preschool children, as well as to all individuals concerned with learning disabilities.

1971/13. "A Computer-Based Instructional Management Program for Classroom Use." Richard E. Sass. 70 pp. [$1]
An instructional management program was developed which was based on a general model for specifying hierarchical curriculum structure, the directed graph. An interactive computer program is described which permits the generation of a structural hierarchy by specifying prerequisite relations among lessons. Student mastery data and the curriculum structure information are both used by an interactive program by means of which a student may receive options of learning activities appropriate for him. The utility of the management program was demonstrated by implementing it in a school setting which employed an individualized elementary science curriculum. This report will be of interest to individuals interested in individualized instruction and in the use of the computer as a classroom resource. (ED 052 621)

1971/14. "The Application of Item Generators for Individualizing Mathematics Testing and Instruction." Richard L. Ferguson and Tse-chi Hsu. 18 pp. [50¢]
A procedure for utilizing a computer to generate domain-referenced tests using item generators is described, and an illustration provided of how the latter can be used to assist measurement and instruction in an individualized mathematics program. This report represents current ideas that are subject to change based

on more experience with the procedure. Measurement specialists and individuals following computer applications in education should find the report of interest. (ED 053 935)

1971/15. "Techniques for Considering Multiple Measurements." William W. Cooley. In Robert L. Thorndike (Ed.), Educational Measurement. Washington, D. C.: American Council on Education, 1971. Pp. 601-622. [50¢]
This chapter introduces some of the techniques in current use for the simultaneous consideration of multiple measurements that allow inferences to be made either about individuals or about groups of individuals. The "parallel-stalk" and trait-space models are described, along with four techniques for reducing dimensionality--(1) principal components, (2) discriminant analysis, (3) multiple regression, and (4) canonical correlation. This chapter will be of particular interest to individuals interested in a general overview of multivariate data analysis.

1971/16. "Drill-and-Practice in CAI Spelling: Project Interim Report #1. Word Ratings and Instructional Treatment." Karen K. Block, Shirley Tucker, and Nancy B. Peskowitz. 37 pp. [50¢]
This report presents preliminary notions regarding the interface between drill-and-practice and tutorial CAI in spelling in terms of what students might be learning and how it relates to external program characteristics. One line of research into the design of drill-and-practice programs is noted and data from a pilot study comparing predicted and subsequent spelling accuracy are discussed. The intended audience includes learning and instructional psychologists and professional educators. (ED 052 628)

1971/17. "Association and Uncertainty: Norms of Association to Ambiguous Words." Charles A. Perfetti, Robert Lindsey, and Blaine Garson. 56 pp. [$1]
Norms of free association to common ambiguous English words are reported. Responses were categorized on the basis of sense relevance. On this basis, the sense dominance of the words was quantified, and the degree of ambiguity associated with each word estimated by the information measure U. This publication will be of interest primarily to researchers in verbal learning and psycholinguistics. (ED 059 215)

1971/18. "Task Sequence and Overtraining in Children's Learning and Transfer of Double Classification Skills." John L. Caruso and Lauren B. Resnick. 29 pp. [50¢]
This paper reports the results of an experiment that attempted to: (1) empirically validate a hypothesized hierarchical sequence of three double classification tasks; (2) investigate transfer to an untrained Piagetian double classification task; and (3) assess the effects of overtraining a relatively easy task on the learning of a more difficult task, as compared with learning a related task of intermediate difficulty. The intended audience includes psychologists interested in learning and instruction or cognitive development, and instructional designers interested in the generation and validation of learning hierarchies. (ED 058 969)

1971/19. "Phonic Analysis Training and Beginning Reading Skills." Jerome Rosner. 8 pp. [50¢]
Phonic analysis skills have been shown to correlate highly with reading ability. The study reported in this paper probed: (1) the possibility of training such skills with beginning first-graders, and (2) the effect of the training on reading

performance. Sixteen illiterate first-graders with equivalent analysis skills were stratified according to IQ and randomly sorted into two groups. All were given reading instruction. One group only was given phonic analysis training. Posttest scores showed significant differences between groups in phonic analysis skills, reading words drawn from their instructional material, and reading unfamiliar words constructed from familiar graphemes. Educational implications are discussed. The paper is intended for psychologists and reading specialists. (ED 059 029)

1971/20. "Teacher Behavior in an Informal British Infant School." Lauren B. Resnick. 32 pp. [50¢] Subsequently published in School Review, 1972, 81(1), 63-83.
Systematic observation of teacher behavior in several classrooms of an informal British infant school was undertaken in order to determine typical patterns of interaction between teacher and child. On the basis of the data gathered and other reports, informal teaching styles are analyzed for their means of fulfilling critical functions of individualized education. Educational researchers are the intended audience. (ED 059 181)

1971/21. "The Relative Effectiveness of Observing Response vs. Predifferentiation Pretraining on Children's Discrimination Learning." Billie J. Vance and Alexander W. Siegel. Psychonomic Science, 1971, 24(4), 183-185. [50¢]
A study was conducted to assess the relative effectiveness of four components of pretraining on a subsequent simultaneous discrimination and reversal. Seventy-two first-grade children served as Ss. Two sets of stimuli were used: line drawings of cats and line drawings of children's faces. Although none of the pretraining conditions had a facilitating effect for Ss seeing the faces, there were significant facilitative effects for Ss seeing cats. Specifically, the three pretraining conditions involving same-different judgments facilitated both learning and reversal, whereas the effect of "observing response alone" pretraining had no such facilitative effect. The intended audience consists of experimental child psychologists. (ED 058 968)

1971/22. "The Visual Analysis Test: An Initial Report." Jerome Rosner. 21 pp. [50¢]
A copying test (VAT) is described in which the test items can function as teaching objectives with the expectation that acquiring competency in the represented behaviors will be generalized to other visual-motor tasks. Six hundred and sixty-seven children in kindergarten, first, and second grade were tested. Results show: (1) a reliable scoring method; (2) a broad range of individual differences between and within the three age groups; and (3) significant predictive validity to the norm-referenced Rutgers Drawing Test. Item difficulty is analyzed and implications are discussed. The paper is intended for psychologists, child development specialists, and teachers concerned with early learning.

1971/23. "An Investigation of Selected Procedures for the Development and Evaluation of Hierarchical Curriculum Structures." Robert F. Boozer and C. M. Lindvall. 36 pp. [50¢]
A study was conducted to investigate a methodology that may be useful in the formative evaluation of the sequence and structure of curriculum units and instructional objectives. The populations under study consisted of the student enrollment in three schools employing the Individually Prescribed Instruction (IPI) system for elementary-school mathematics. To examine structural relationships, as they are found in different content areas and levels, student

performance on unit placement tests and pretests in 30 IPI mathematics units consisting of 173 specific objectives was investigated through scalogram and simplex analyses. The results of the study demonstrated the usefulness of these procedures in providing suggestions for the revision and refinement of curriculum structures. The paper will be of interest to individuals engaged in the development of instructional systems, especially the design of testing and curriculum materials.

1971/24. "A Beginning Reading Program 'Stepping Stones to Reading': Summary Report." Roselyn Frankenstein. 45 pp. [50¢]
This report describes a beginning reading program designed to ease the decoding problem for beginning readers in a way that allows them to acquire a relatively large reading vocabulary. In this program, vowels are "color-coded" so that various visual representations of the same sound can be introduced simultaneously because they maintain a feature in common. Data obtained in field tests of the program are presented. The report will be of interest to teachers, curriculum designers, and others concerned with reading instruction.

1971/25. "Reinforcement: Applied Research." Montrose M. Wolf and Todd R. Risley. "Applying Applied Reinforcement." Lauren B. Resnick. In Robert Glaser (Ed.), The Nature of Reinforcement. New York: Academic Press, 1971. Pp. 301-333. [50¢]
These two papers examine the applicability of reinforcement principles in natural social settings. The first paper concentrates on the methodology of applied research and gives several examples of applied studies. The second paper considers a number of specific questions raised by the attempt to apply reinforcement principles in educational and therapeutic settings, and suggests some lines of further research. The papers should be of interest to individuals concerned with the methodology of applied research and development in general, as well as to those with a particular concern for applied reinforcement.

1971/26. "Methods of Evaluating School Innovations." William W. Cooley. 26 pp. [50¢]
Examples from the Learning Research and Development Center's evaluation activities are used to illustrate aspects of a general evaluation model, which includes consideration of the entering behaviors of students, determination of the degree to which an innovation is actually implemented in a large number of classrooms, and measurement of changes in achievement produced by the innovation. Techniques for using the classroom as the unit of analysis for this type of evaluative research are also illustrated. This paper was an Invited Address to the 79th Annual American Psychological Association Convention. The intended audience consists of psychologists concerned with the evaluation of new school programs. (ED 057 087)

REPRINTS: 1964-1970

1. "Toward a Behavioral Science Base for Instructional Design." Robert Glaser. In R. Glaser (Ed.), Teaching Machines and Programed Learning II: Data and Directions. Washington, D.C.: National Education Association, 1965. Pp. 771-809. [50¢] (ED 010 516)

2. "Response Contingencies in Teaching-Machine Programs." James G. Holland. The Journal of Programed Instruction, 1964, 3, 1-8. [50¢]

3. "Technology in Special Education--Some Implications." A. Edward Blackhurst. Exceptional Children, 1965, 31(9), 449-456. (Not Available)

4. "Item Selection Techniques and Evaluation of Instructional Objectives." Richard C. Cox. Journal of Educational Measurement, 1965, 2(2), 181-185. (Not Available)

5. "The Design of Instruction." Robert Glaser. In Sixty-fifth Yearbook of the National Society for the Study of Education, Part II. Chicago: NSSE, 1966. Pp. 215-242. (Out of Print. Available from ERIC, ED 011 509.)

6. "The Learning Research and Development Center's Computer Assisted Laboratory." Ronald G. Ragsdale. DECUS Proceedings, 1966, 5(2), 65-68. (Out of Print. Available from ERIC, ED 014 901.)

7. "A Comparison of Item Selection Techniques for Norm-Referenced and Criterion-Referenced Tests." Richard C. Cox and Julie S. Vargas. Paper presented at the Annual Meeting of the National Council on Measurement in Education, Chicago, 1966. 7 pp. (Out of Print. Available from ERIC, ED 010 517.)

8. "Variables in Discovery Learning." Robert Glaser. In L. S. Shulman and E. R. Keislar (Eds.), Learning by Discovery: A Critical Appraisal. Chicago: Rand McNally, 1966. Pp. 13-26. (Out of Print. Available from ERIC, ED 010 518.)

9. "The Task of Evaluation in Curriculum Development Projects: A Rationale and Case Study." C. M. Lindvall. The School Review, 1966, 74(2), 159-167. (Not Available)
This article describes the role of evaluation as it evolved in the Curriculum Continuity Demonstration (CCD), a joint project of the Pittsburgh Schools and the University of Pittsburgh. It discusses experiences of the project in using such instruments and procedures as standardized tests, locally developed tests, comparison or control groups, and expert observers. It then presents a revised evaluation program focusing on what would now be termed "formative evaluation." The rationale for the latter approach is derived from the five components of "the evaluator's question." This question is phrased as: "(1) Does this innovation (2) in the situation with which we are concerned (3) do what is desired (4) better (5) than alternatives?"

10. "The Responsive Environments Project and the Deaf." Omar Khayyam Moore. American Annals of the Deaf, 1965, 110(5), 604-614. (Not Available)

11. Some Implications of Previous Work on Learning and Individual Differences." Robert Glaser. In R. Gagné (Ed.), Learning and Individual Differences. Columbus, Ohio: Charles E. Merrill Publishing Company, 1967. Pp. 1-18. (Not Available)

12. "Simulation of Cognition and Learning: The Role of Individual Differences." Paul M. Kjeldergaard. In R. Gagné (Ed.), Learning and Individual Differences. Columbus, Ohio: Charles E. Merrill Publishing Company, 1967. Pp. 218-233. (Not Available)

13. "Programing Motion Pictures: The Conversion of a PSSC Film into a Program." Philip G. Schrag and James G. Holland. AV Communication Review, 1965, 13(4), 418-422. (Not Available)

14. "Studies of the Use of Programmed Instruction in the Intact Classroom." Robert Glaser, James H. Reynolds, and Margaret G. Fullick. Psychology in the Schools, 1966, 3(4), 318-333. [50¢]

15. "Models and Explanations in the Behavioral Sciences." Alan Ross Anderson and Omar K. Moore. In G. J. Direnzo (Ed.), Concepts, Theory, and Evaluation in the Behavioral Sciences. New York: Random House, 1966. Pp. 75-90. (Not Available)

16. "Programed Instruction in the Schools: An Application of Programing Principles in 'Individually Prescribed Instruction'." C. M. Lindvall and John O. Bolvin. In Sixty-sixth Yearbook of the National Society for the Study of Education, Part II. Chicago: NSSE, 1967. Pp. 217-254. [50¢]
This chapter first reviews the current status of the use of programmed instruction in classrooms. It then describes the IPI procedure as being based on the more general application of principles of programmed instruction to a total curriculum involving the coordinated use of tests, lesson materials, and teaching practices. A specific description and examples of the IPI testing procedure, prescription development practices, and lesson materials are provided.

17. "An Individualized Science Laboratory." Joseph I. Lipson. Science and Children, 1966, 4(4), 8-12. [50¢]

18. "The Development of a Sequentially Scaled Achievement Test." Richard C. Cox and Glenn T. Graham. Journal of Educational Measurement, 1966, 3(2), 147-150. [50¢]

19. "Psychological Bases for Instructional Design." Robert Glaser. AV Communication Review, 1966, 14(4), 433-449. [50¢]

20. "A Quantitative Measure for Programmed Instruction." James G. Holland. American Educational Research Journal, 1967, 4(2), 87-101. [50¢]
This paper describes a series of experiments which developed and demonstrated a measure for programmed instruction. Material is programmed only to the extent that the correct answer is contingent upon appropriate preceding behavior. The measure, called the blackout ratio, is the percentage of material that can be obliterated without increasing the error rate of the material. The paper contains a demonstration of the blackout technique, how the

objectivity, validity, and reliability of the measure were determined, how posttest performance relates to blackout ratios, and how the blackout ratio technique clarifies conflicting results of previous experiments in programmed instruction.

21. "The Responsive Environments Project." Omar Khayyam Moore and Alan Ross Anderson. In R. D. Hess and R. Bear (Eds.), Early Education. Chicago: Aldine Publishing Company, 1968. Pp. 171-189. A 14-page bibliography is appended. [50¢]

22. "Individualized Instruction in Elementary Mathematics." Joseph I. Lipson. In J. M. Scandura (Ed.), Research in Mathematics Education. Washington, D.C.: National Council of Teachers of Mathematics, 1967. Pp. 70-79. [50¢]

23. "The Student-Machine Interface in Instruction." Robert Glaser and William W. Ramage. In 1967 IEEE International Convention Record, Part 10. New York: Institute of Electrical and Electronics Engineers, 1967. Pp. 52-59. (Out of Print. Available from ERIC, ED 015 843.)

24. "Objectives and Evaluation: An Individualized System." Robert Glaser. Science Education News, 1967, 1-3. [50¢] (ED 015 844)

25. "Implications for 'Culture Conflict' from a Semantic Feature Analysis of the Lexicon of the Hard Core Poor." Rosalie Cohen, Gerd Fraenkel, and John Brewer. Sociology Quarterly, 1968, 10, 19-28. [50¢]

26. "Adapting the Elementary School Curriculum to Individual Performance." Robert Glaser. In Proceedings of the 1967 Invitational Conference on Testing Problems. Princeton: Educational Testing Service, 1968. Pp. 3-36. [50¢]

27. "Concept Learning and Concept Teaching." Robert Glaser. In R. M. Gagné and W. J. Gephart (Eds.), Learning Research and School Subjects. Itasca, Illinois: F. E. Peacock Publishers, Inc., 1968. Pp. 1-38. [50¢]

28. "An Exploratory Investigation of Selected Measures of Rate of Learning." John L. Yeager and C. M. Lindvall. Journal of Experimental Education, 1967, 36, 78-81. [50¢]
Three possible measures of rate of learning that might be employed in Individually Prescribed Instruction classrooms were investigated. The three measures were number of units completed by a student in one year, time required to cover given units, and amount of content mastered per day. Although one measure showed a minor degree of consistency over different units of instruction, the results implied that rate of learning is not a general characteristic of the learner.

29. "Learning." Robert Glaser. In R. L. Ebel (Ed.), Encyclopedia of Educational Research. (4th ed.) New York: Macmillan, 1969. Pp. 706-733. (Out of Print. Available from ERIC, ED 019 140.)

30. "PAVLOV: An Information Retrieval Program for the Analysis of Learning Data." Paul M. Kjeldergaard. Psychological Reports, 1967, 21, 837-841. [50¢]

31. "Implications of the Individualization of Instruction for Curriculum and Instructional Design." John O. Bolvin. Audiovisual Instruction, 1968, 13, 238-242. [50¢]

32. "Some Principles for the Design of Clarifying Educational Environments." Omar K. Moore and Alan Ross Anderson. In D. A. Goslin (Ed.), Handbook of Socialization Theory and Research. Chicago: Rand McNally, 1969. Pp. 571-613. (Out of Print. Available from ERIC, ED 030 174.)

33. "The Learning Research and Development Center at the University of Pittsburgh." John L. Yeager and Robert Glaser. The Journal of Research and Development in Education, 1968, 1, 31-44. [50¢]
The purposes and goals of LRDC are described, along with research and development activities in four program areas: Basic Learning Studies, Computer-Assisted Instruction Studies, Field Research, and Experimental School Development. (ED 028-493)

34. "Evaluating an Instructional Innovation Through the Observation of Pupil Activities." John L. Yeager and C. M. Lindvall. The High School Journal, 1968, 51(6), 248-253. [50¢]
A study was conducted to demonstrate the role of classroom observation in curriculum evaluation of the development and dissemination of the Individually Prescribed Instruction program. The activities of pupils at two IPI schools were observed and recorded under five major categories at two-minute intervals. Results of the study indicated that observational procedures are an important element in curriculum evaluation in that observational data can be valuable in developing the innovation, useful in defining the innovation, and essential in monitoring the dissemination of an instructional innovation.

35. "Grouping." Glen Heathers. In R. L. Ebel (Ed.), Encyclopedia of Educational Research. (4th ed.) New York: Macmillan, 1969. Pp. 559-570. (Out of Print. Available from ERIC in microfiche only, ED 026 135.)

36. "Operant Control of Eye Movements During Human Vigilance." Stephen R. Schroeder and James G. Holland. Science, 1968, 161, 292-293. [50¢]
Eye movements were used as a criterion of observing responses in a vigilance task. Time on watch and signal rates similarly affected both eye movement rates and percentage of detections. Observing rate may account for detection data, and may be a more stable measure of vigilance than detection rate, especially when very few signals occur. (ED 031 412)

37. "Operant Control of Eye Movements." Stephen R. Schroeder and James G. Holland. Journal of Applied Behavior Analysis, 1968, 1(2), 161-166. [50¢]
In a monitoring situation, eye movements were required in order for signals to be presented. Detection of signals was the reinforcement. A multiple schedule of fixed-interval reinforcement, differential reinforcement of low rate, and fixed-ratio reinforcement was established for eye movements. Results demonstrated that an eye movement can act as an operant controlled by its consequences. Operant control of eye movements has important implications for human factor analysts concerned with "attention."

38. "Developmental Aspects of Individually Prescribed Instruction." John O. Bolvin and Robert Glaser. Audiovisual Instruction, 1968, 13, 828-831. [50¢] (ED 031 768)

39. "Evaluation as an Essential Tool in the Field Testing and Dissemination of Educational Products." John L. Yeager. SRIS Quarterly, 1968, 1(2), 20-22. [50¢] In order for an educational innovation to be as successful as the original model, a monitoring procedure is essential in the development, field trial, and dissemination of the innovation. Once a program is carefully defined, a detailed description of the plan of innovation provides the criteria for determining the extent to which a replication represents a true implementation of the original model. Monitoring carried out in field testing consists of identifying the essential elements of the original model and testing to see if these elements are present in the replication. In the dissemination phase, monitoring is concerned with the degree to which the implementation process is successful.

40. "The Role of Evaluation in Programs for Individualized Instruction." C. M. Lindvall and Richard C. Cox. In Sixty-eighth Yearbook of the National Society for the Study of Education, Part II. Chicago: NSSE, 1969. Pp. 156-188. [50¢] This chapter deals with two roles for evaluation: (1) obtaining pupil performance data to use in planning and monitoring individual programs of study, and (2) gathering and analyzing data for purposes of improving an instructional system. The Winnetka Plan and the Eight-Year Study are presented as classical attempts to employ evaluation to serve these purposes. The major portion of the chapter describes a "structured curriculum model" for individualized instruction, of which Individually Prescribed Instruction is one example. Specific procedures as used in the IPI evaluation program are described in considerable detail.

41. "Criterion-Referenced Testing for the Measurement of Educational Outcomes." Robert Glaser and Richard C. Cox. In R. A. Weisgerber (Ed.), Instructional Process and Media Innovation. Chicago: Rand McNally, 1968. Pp. 545-550. [50¢]

42. "The Relation between Socio-Conceptual Styles and Orientation to School Requirements." Rosalie Cohen. Sociology of Education, 1968, 41(2), 201-220. [50¢] (ED 031 771)

43. "The Design and Programming of Instruction." Robert Glaser. In The Schools and the Challenge of Innovation. Supplementary Paper No. 28. New York: Committee for Economic Development, 1968. Pp. 156-215. [$1]

44. "A Model for Non-Gradedness: The Reading Program for Individually Prescribed Instruction." Isabel L. Beck and John O. Bolvin. Elementary English, 1969, 46(2), 130-135. [50¢] (ED 033 832)

45. "Sentence Retention and the Depth Hypothesis." Charles A. Perfetti. Journal of Verbal Learning and Verbal Behavior, 1969, 8, 101-104. [50¢]

46. "Evaluation of Instruction and Changing Educational Models." Robert Glaser. Los Angeles: Center for the Study of Evaluation of Instructional Programs, 1968. (CSEIP Occasional Report No. 13) 27 pp. [50¢]

47. "Systems Approaches in Guidance." William W. Cooley and Raymond C. Hummel. Review of Educational Research, 1969, 39(2), 251-262. [50¢]
An overview is presented of the systems approach and how it differs from traditional research. Several major contemporary efforts to apply systems techniques to guidance are briefly described. This chapter will be of interest to both practitioners and researchers in the field of guidance.

48. "Recognition Memory for Item and Order Information." Wayne Donaldson and Herta Glathe. Journal of Experimental Psychology, 1969, 82(3), 557-560. [50¢]
A short-term recognition memory task was designed to provide signal detection measures of the retention of both the items presented and the order in which the items occurred. The results indicated that the receiver-operating characteristics for both types of information can be characterized as resulting from underlying, overlapping normal distributions. The intended audience consists of experimental psychologists in the areas of recognition memory, decision processes, and memory processes.

49. "Science Education in 1991." Leopold E. Klopfer. The School Review, 1969, 77(3), 199-217. [50¢] (ED 035 557)

50. "Approaches to the Validation of Learning Hierarchies." Lauren B. Resnick and Margaret C. Wang. In Proceedings of the Eighteenth Annual Western Regional Conference on Testing Problems, Educational Testing Service, 1969. Pp. 14-38. [50¢]
A program of research in the application of scalogram analysis to the validation of learning hierarchies is described, together with the development of an alternative method for assessing hierarchical relationships among tests of instructional objectives. The relationship between scalability of tests and positive transfer between objectives in the course of learning is discussed, and experimental transfer studies testing hierarchical hypotheses are described. Related research by developmental and learning psychologists and by test designers is reported, along with the authors' own research. Educational researchers, psychologists, and instructional designers are the intended audience. (ED 035 943)

51. "IPI Science: A Teaching Revolution in the Making." Leopold E. Klopfer and Victor L. Weber, Jr. Science Activities, 1969, 1(1), 27-30. [50¢] (ED 040 045)

52. "Response Latency as a Function of Training Method, Information Level, Acquisition, and Overlearning." Wilson A. Judd and Robert Glaser. Journal of Educational Psychology Monograph, 1969, 60(4), Part 2. 30 pp. [50¢]

53. "The Computer and Individualized Instruction." William W. Cooley and Robert Glaser. Science, 1969, 166, 574-582. [50¢]
A prototype computer-based management and information system being implemented by LRDC at an individualized elementary school is described. Examples are presented of the kinds of student progress data made available by the computer to teachers, curriculum developers, and researchers. The intended audience consists of individuals interested in computer applications in individualizing education.

54. "Lexical Density and Phrase Structure Depth as Variables in Sentence Retention." Charles A. Perfetti. Journal of Verbal Learning and Verbal Behavior, 1969, 8(6), 719-724. [50¢]

55. This reprint consists of three articles:
    I. "Selective Eye Movements to Simultaneously Presented Stimuli During Discrimination." Stephen R. Schroeder. Perception and Psychophysics, 1970, 7(2), 121-124.
    II. "Fixation and Choice Selectivity During Discrimination Transfer." Stephen Schroeder. Psychonomic Science, 1969, 17(6), 324-325.
    III. "Reinforcement of Eye Movement with Concurrent Schedules." Stephen R. Schroeder and James G. Holland. Journal of the Experimental Analysis of Behavior, 1969, 12(6), 897-903.
    [The cost for Reprint 55 is 50¢ per copy.]

56. "Relations Between Perceptual and Syntactic Control in Oral Reading." Lauren B. Resnick. Journal of Educational Psychology, 1970, 61(5), 382-385. [50¢]

57. "Computer Assistance for Individualized Education." William W. Cooley. Journal of Educational Data Processing, 1970, 7, 18-28. [50¢]
    Three areas of possible computer assistance to individualized education are discussed: (1) providing teachers with basic information for monitoring and planning student progress, (2) testing, and (3) instruction. An ongoing LRDC investigation to determine how much support a small computer can provide in each area is briefly described, along with a typical day in the life of a student in an individualized elementary school with computer assistance. This article will be of interest to individuals interested in computer applications in individualizing education.

58. "The Role of the Teacher in Individually Prescribed Instruction." C. M. Lindvall and John O. Bolvin. Educational Technology, 1970, 10(2), 37-41. [50¢]
    The unique tasks of the teacher working in an IPI classroom are described in some detail. These tasks include the specific functions that are needed if the basic system is to operate and the type of subjective diagnosis and personal tutoring that the teacher must carry out. The article places particular emphasis on the role of the teacher in helping students to acquire capabilities for setting their own goals, planning a meaningful instructional program, and evaluating and monitoring their activities as learning progresses.

59. "Towards Humanistic Goals Through Behavioral Objectives." Isabel Beck. In J. Maxwell and A. Tovatt (Eds.), On Writing Behavioral Objectives for English. Champaign, Illinois: National Council of Teachers of English, 1970. Pp. 97-105. [50¢]

60. "Use of the Canonical Correlation Analysis in an Investigation of Pupil's Rate of Learning in School." Margaret C. Wang. The Journal of Educational Research, 1970, 64(1), 35-45. [50¢]

61. "Individualized Science: Relevance for the 1970's." Leopold E. Klopfer. Science Education, 1971, 55(4), 441-448. [50¢]

62. "The Touch-Sensitive Screen as a Flexible Response Device in CAI and Behavioral Research." Robert J. Fitzhugh and David Katsuki. Behavioral Research Methods and Instrumentations, 1971, 3, 159-164. [50¢]

63. "Individual Differences in Learning." Robert Glaser. In K. A. Neufeld (Ed.), Individualized Curriculum and Instruction, Proceedings of the Third Invitational Conference on Elementary Education. Edmonton, Alberta: University of Alberta, 1970. Pp. 17-31. [50¢]

64. "Operant Conditioning of the Human Salivary Response." Daniel A. Frezza and James G. Holland. Psychophysiology, 1971, 8(5), 581-587. [50¢]
To demonstrate operant conditioning of the human salivary response, stimulus control was attempted. Unstimulated parotid saliva was collected from four subjects under two reinforcement schedules. For three subjects, responding increased under continuous reinforcement and decreased under reinforcement for non-responding, apparently without muscle mediation.

65. "Conceptual Styles, Culture Conflict, and Nonverbal Tests of Intelligence." Rosalie A. Cohen. American Anthropologist, 1969, 71(5), 828-856. [50¢]

WORKING PAPERS: 1965-1970

1. "The New Pedagogy." Robert Glaser, 1965, revised 1967, 14 pp. [50¢] (ED 010 205)

2. "The Program for Individually Prescribed Instruction." Robert Glaser, 1966, 8 pp. (Out of Print. Available from ERIC, ED 010 519.)

3. "An Exploratory Investigation of Selected Measures of Rate of Learning." C. M. Lindvall and John L. Yeager, 1966, 8 pp. (Out of Print. Available from ERIC, ED 010 520.) Republished in 1967 as Reprint 28.

4. "Variability of Pupil Achievement in Mathematics." John O. Bolvin, 1966, 12 pp. (Out of Print. Available from ERIC, ED 039 120.)

5. "Transfer and Generalization in Individually Prescribed Instruction." Joseph I. Lipson, 1966, 13 pp. (Out of Print. Available from ERIC, ED 010 521.)

6. "The Development of a Sequentially Scaled Achievement Test." Richard C. Cox and Glenn T. Graham, 1966, 9 pp. (Out of Print. Available from ERIC, ED 010 206.) Republished in 1966 as Reprint 18.

7. "The Development of an Elementary School Mathematics Curriculum for Individualized Instruction." Joseph I. Lipson, Henry B. Cohen, and Robert Glaser, 1966, 27 pp. (Out of Print. Available from ERIC, ED 013 120.)

8. "The Project for Individually Prescribed Instruction (The Oakleaf Project)." C. M. Lindvall and John O. Bolvin, 1966, 15 pp. (Out of Print. Available from ERIC, ED 010 522.)

9. "Recent Developments in Data Collection and Analysis for Experiments." Ronald G. Ragsdale, 1966, 9 pp. (Out of Print. Available from ERIC, ED 010 207.)

10. "A Selected Bibliography on Socio-Culturally Disadvantaged Children and Youth and Related Topics." Herbert A. Aurbach, 1966, 28 pp. (Out of Print. Available from ERIC, ED 010 523.)

11. "Grapheme-Phoneme Regularity and its Effects on Early Reading: A Pilot Study." Paul M. Kjeldergaard and Roselyn Frankenstein, 1967, 13 pp. (Out of Print. Available from ERIC, ED 011 227.)

12. "The Education of Individuals." Robert Glaser, 1966, 7 pp. (Out of Print. Available from ERIC, ED 014 785.)

13. "A Selected and Annotated Bibliography of Studies Concerning the Taxonomy of Educational Objectives: Cognitive Domain." Richard C. Cox and Nancy Jordan Unks, 1967, 33 pp. (Out of Print. Available from ERIC, ED 013 655.) Republished in 1970 as Monograph 1.

14. "Socioeconomic Status and Students' Educational Desires." Donald Q. Brodie and Edward A. Suchman, 1967, 12 pp. [50¢]

15. "Diagnosis of Pupil Achievement in the Individually Prescribed Instruction Project." Richard C. Cox and M. Elizabeth Boston, 1967, 38 pp. [50¢]
This working paper presents a description of the IPI testing program as it existed in November 1967. The diagnostic instruments for IPI mathematics, reading, and science programs are described. Placement tests, unit pre- and post-tests, and curriculum-embedded tests are distinguished as to purpose, composition, and use. Examples of each type of test are included. The paper provides information on the testing program which should be useful for teachers, aides, and administrators in a school system where the IPI system is being considered for adoption or for any individuals interested in the IPI testing program. (ED 023 296)

16. "Design of an Early Learning Curriculum." Lauren B. Resnick, 1967, 62 pp. [$1]
This paper presents a rationale for curriculum development in the preschool years and outlines a methodology for curriculum design in general. Appropriate content and sequencing of an early learning curriculum are discussed, together with questions of implementation and validation. Extensive appendices list behavioral objectives for early learning. The intended audience consists of early learning psychologists and curriculum designers. (ED 018 393)

17. "Evaluating Teacher Functions." John O. Bolvin, 1967, 15 pp. [50¢] (ED 020 573)

18. "Learning, Mental Health, and Testing." Glen Heathers, 1966, 11 pp. [50¢] (ED 029 304)

19. "Extinction in Discrimination Learning: Presentation and Contingency Variables and Associated Side Effects." Miriam Cohen, Robert Glaser, and James G. Holland, 1968, 27 pp. (Out of Print. Available from ERIC, ED 019 139.)

40. "On Responsive Environments." Omar Khayyam Moore, 1967, 10 pp. [50¢] (ED 018 278)

41. "The Principal Component Structure of Multiple Guttman Scales." Jon Magoon and Richard C. Cox, 1968, 14 pp. [50¢]

42. "The Application of a Model for Deriving More Meaning from Standardized Test Results." Richard C. Cox and Barbara G. Sterret, 1968, 8 pp. [50¢]

43. "A Suggested Approach to the Elementary School Science Curriculum." Joseph I. Lipson, 1968, 18 pp. [50¢] (ED 035 539)

44. "An Information and Management System for Individually Prescribed Instruction." William W. Cooley and Robert Glaser, 1968, 34 pp. (Out of Print. Available from ERIC, ED 026 862.) Republished in 1969 as Reprint 53.

45. "Children's Ability to Operate Within a Matrix: A Developmental Study." Alexander W. Siegel and Esther Kresh, 1968, 22 pp. [50¢] Subsequently published in Developmental Psychology, 1971, 4(2), 232-239.
Forty children, ages 4-8 years, were presented three tasks intended to tap the ability to deal with extensional and intensional aspects of classification in a

matrix format. Performance on all three tasks increased with age. Correlations among the tasks indicated that for younger children (4-7 years) the two tasks intended to tap the extensional aspect of classification were significantly positively related, but were essentially independent of the intensional task. For 8-year-olds, the two extensional tasks were independent, while the intensional task was highly related to only one of the extensional tasks. These results are discussed in terms of older children's "concrete-operational" functioning and of the required production of different kinds of verbal mediators. The intended audience consists of experimental child psychologists. (ED 029 715)

46. "An Investigation of the Relationship Between Selected Student Entering Characteristics and Time Required to Achieve Unit Mastery." John L. Yeager and Mary Ann Kissel, 1969, 20 pp. [50¢]
The relationship between a composite of student entering characteristics and the amount of time required to complete a given unit of mathematics was investigated. This examination included intercorrelations between the criterion and five variables: unit pretest score, number of skills to be mastered in the unit, student's intelligence quotient, student's chronological age, and total units previously mastered. Results of the study indicated that amount of time required to master a given unit was related to the student's initial entering state, with the most important factors being the student's unit pretest score, number of skills to master, and the student's age. (ED 031 938)

47. "The Identification of Children with Perceptual-Motor Dysfunction." Jerome Rosner, Vivien Richman, and Russell H. Scott, 1969, 58 pp. [$1]
This paper presents a battery of screening tasks for sampling the auditory, visual, and general perceptual-motor skills of children from ages 6 to 11. Validation data, based upon use of the battery with groups of emotionally disturbed, retarded, and normal children, are included. The paper will be useful to school personnel, psychologists, optometrists, and others who work with children manifesting learning disabilities. (ED 037 837)

48. "Signal Detection Analysis of Recall and Recognition Memory." Wayne Donaldson and Herta Glathe, 1969, 22 pp. [50¢] Subsequently published in the Canadian Journal of Psychology, 1970, 24, 42-56.
Three paired-associate learning studies were run to compare the signal detection analysis of recall and recognition memory performance. The data suggested that for purposes of comparing recall and recognition, an ROC analysis of recall data is inappropriate and that a better approach is use of the "forced-choice" model. The intended audience consists of experimental psychologists in the areas of recognition memory, decision processes, and memory processes. (ED 041 459)

49. "Computer-Assisted Criterion-Referenced Testing." Richard L. Ferguson, 1969, 16 pp. [50¢]
This paper reports preliminary investigation, from both a development and implementation perspective, of a computer-assisted test model appropriate for testing a set of objectives for which a hierarchy of prerequisite relationships is known. A computer was used to generate and present items and then score the student's constructed response. Applying a sequential probability ratio test after each item, the computer classified the examinee as to his proficiency in the skill being tested. After a classification decision was made, the student was branched to another objective according to specified criteria based upon the hierarchy and

his level of performance on the current skill. The paper was published with some revisions under the title "A Model for Computer-Assisted Criterion-Referenced Measurement" in Education, 1970, 81(1), 25-31. The intended audience consists of measurement specialists and persons interested in computer applications in individualizing education. (ED 040 061)

50. "Eye Movements as a Function of Response Contingencies Measured by Blackout Technique." Judith Doran and James G. Holland, 1969, 16 pp. [50¢] Subsequently published in the Journal of Applied Behavior Analysis, 1971, 4(1), 11-18. The study reported in this paper determined if low response-contingent material is read less thoroughly than programmed material heavily response contingent. Response contingency was measured by blackout ratio, which is the percentage of material that may be deleted without increasing error rate. In high blackout ratio programs, obtaining a correct answer is contingent upon only a small portion of the item. Eye movements were compared for two versions of the same program which, through alteration of the required responses, had different blackout ratios. On the high blackout ratio version, subjects used fewer fixations, shorter fixations, and less scanning time. (ED 038 265)

51. "Visual and Haptic Dimensional Preference: A Developmental Study." Alexander W. Siegel and Billie J. Vance, 1969, 23 pp. [50¢] Subsequently published in Developmental Psychology, 1970, 3, 264-266.
Sixteen children at each of four grade levels, preschool, kindergarten, grade 1, and grade 3, were given dimensional preference tasks in both visual and haptic modalities, with three-dimensional stimuli varying in form, size, and color or texture. The pattern of preference scores was essentially the same in both visual and haptic tasks. For both tasks, all age groups, except the preschoolers, showed marked form dominance. Form was especially salient for the kindergarteners. Color, texture, and size preferences were relatively low at all ages. The intended audience consists of experimental child psychologists. (ED 038 268)

52. "Observing Behavior and Children's Discrimination Learning." Sondra B. Goldstein and Alexander W. Siegel, 1969, 17 pp. [50¢] Subsequently published in Child Development, 1971, 42(5), 1608-1613.
Forty-eight grade 3 children learned a successive two-choice discrimination under one of three conditions: immediate reinforcement (IM), 10-second empty delay (ED), and 10-second delay with the discriminative stimuli in view of S (FD). The performances of groups IM and FD were only marginally different, and both were superior to that of group ED. The reversal performances of the three groups did not differ significantly. Average latencies were significantly longer in groups FD and ED than in IM. It was concluded that in group FD a set to observe stimuli was established during delay which generalized to the preresponse interval and facilitated performance. Experimental child psychologists are the intended audience.

53. "The Design of an Individualized Perceptual Skills Curriculum." Jerome Rosner, 1969, 32 pp. [50¢]
This paper presents the rationale applied in designing a curriculum for teaching perceptual skills in a classroom. An overview of the organization of the curriculum is provided. The paper should be of interest to psychologists and others concerned with preschool development and its relationship to school learning. (ED 038 725)

54. "Student Behavior and Science Content Categories and Subcategories for a Science Program." Leopold E. Klopfer, 1970, 62 pp. [$1] (ED 038 726)

55. "The Effects of Different Types of Reinforcement on Young Children's Incidental Learning." Alexander W. Siegel and Flo Van Cara, 1970, 17 pp. [50¢] Subsequently published in Child Development, 1971, 42(5), 1596-1601.
One hundred and eight children at three age levels, 5, 7, and 9 years, were presented a three-part successive discrimination task: original learning, presentation of incidental stimuli, and a test of recognition and recall of the incidental material. One-third of the Ss at each age level learned the original task (intentional learning) under one of three reinforcement conditions: Right-blank, Right-Wrong, or Wrong-blank. Contrary to prediction, there were no age differences in incidental recognition or recall. Although the main effect of reinforcement condition was not significant for trials to criterion on intentional learning, children of all ages who learned the original discrimination under the Wrong-blank condition showed significantly higher incidental recognition and recall than Ss tested under Right-Wrong and Wrong-blank conditions. Results are discussed in terms of the effects of a Wrong-blank reinforcement procedure on a child's attention to the task. The intended audience consists of experimental child psychologists. (ED 044 184)

56. "Transfer and Sequence in Learning Double Classification Skills." Lauren B. Resnick, Alexander W. Siegel, and Esther Kresh, 1970, 25 pp. [50¢]
(ED 043 088) Subsequently published in the Journal of Experimental Child Psychology, 1971, 11(1), 139-149.

57. "PEP in the Frick Elementary School: Interim Evaluation Report of the Primary Education Project, 1968-1969." Margaret C. Wang, Lauren B. Resnick, and Patricia A. Schuetz, 1970, 52 pp. [$1] (ED 047 973)

58. "An Investigation of the Effects of the Application and Removal of a Token Economy on the Working Behavior of Sixteen Headstart Children." Patricia Wrobel and Lauren B. Resnick, 1970, 21 pp. [50¢]
A study was conducted to assess the effect of token reinforcement for work behavior in a Headstart classroom and to investigate methods of withdrawing tokens while still maintaining the behavior. The study was divided into two phases. In Phase I a reversal design was employed. Results showed an increase in work behavior for the class as a whole when tokens were introduced. However, several distinct individual response patterns to tokens occurred. In Phase II the tokens were removed in gradual stages. Work behavior was maintained for all subjects. New experimental strategies for applying token systems in the future are suggested. The paper will be of particular interest to psychologists, educational researchers, and behavior modification specialists.

59. "The Effects of Presentation Order in Multitrial Free Recall." Anthony J. Maitland, 1970, 23 pp. [50¢]
The data reported in this paper are from a first attempt to use on-line computer technology to affect the degree of learning in a list learning task. The procedure attempted to test the notion of psychological organization as a prerequisite for recalling previously presented material. The results have given direction to continuing research which, when published, will encompass these data. The paper

is intended to make the procedures and data immediately available to other researchers in the field of organizational process in memory. (ED 047 345)

60. "The Psychology of Learning and Instructional Technology." Robert Glaser, 1970, 16 pp. [50¢] (ED 047 530)

61. "An Exploratory Investigation of the Carroll Learning Model and the Bloom Strategy for Mastery Learning." Margaret C. Wang and C. M. Lindvall, 1970, 15 pp. [90¢] (ED 054 983)

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6. "Graphic Input Tablets for Programmed Instruction." C. A. Booker, Jr., B. R. Dow, and J. E. Lambright, 1966, 21 pp. (Not Available)

7. "The Effects of Task Characteristics on Response Latency and Latency Trends During Learning and Overlearning." Wilson A. Judd, 1968, 83 pp. (Out of Print. Available from ERIC, ED 021 484.) Republished in 1969 as Reprint 52.

8. "Final Report Summary: The Relationship Between Poverty and Educational Deprivation." Edward A. Suchman, Donald Q. Brodie, David H. Richmond, Barry L. Kaufman, David H. Elliott, and Jean L. Elliott, 1968, 15 pp. [50¢] (ED 027 370)

9. "Variability of Response Latency in Paired-Associate Learning as a Function of Training Procedure." Wilson A. Judd and Robert Glaser, 1970, 33 pp. [50¢] (ED 038 724)

MONOGRAPHS: 1970

1. "Taxonomy of Educational Objectives: Cognitive Domain. An Annotated Bibliography." Richard C. Cox and Carol E. Wildemann. 50 pp. [$1] (ED 043 089)

2. "Behavior Analysis in Curriculum Design: A Hierarchically Sequenced Introductory Mathematics Curriculum." Lauren B. Resnick, Margaret C. Wang, and Jerome Kaplan. 81 pp. [$1]
   A method of systematic behavior analysis is applied to the problem of designing a sequence of learning objectives that will provide an optimal match for a child's natural sequence of acquisition of mathematical skills and concepts. On the basis of these analyses, specific sequences of learning objectives are proposed. The monograph concludes with a discussion of the ways in which a hierarchically sequenced early learning curriculum can be used in schools. The intended audience consists of psychologists, educational researchers, and curriculum designers. (ED 047 954)

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Beck, I.	1972/4; R 44, 59
Blackhurst, A. E.	R 3
Block, K.	1971/1, 1971/16
Bolvin, J.	R 16, 31, 38, 44, 58; WP 4, 8, 17
Booker, C.	TR 4, 6
Boozer, R.	1971/6, 1971/23
Boston, M. E.	1972/9; WP 15
Brewer, J.	R 25
Brodie, D.	WP 14; TR 8
Carlson, R.	TR 1
Caruso, J.	1971/18
Chadwick, M.	1971/2
Cohen, H.	WP 7
Cohen, M.	WP 19
Cohen, R.	R 25, 42, 65
Cooley, W.	1971/15, 1971/26; R 47, 53, 57; WP 44
Cox, R.	R 4, 7, 18, 40, 41; WP 6, 13, 15, 41, 42; M 1
Donaldson, W.	R 48; WP 48
Doran, J.	WP 50
Dow, B.	TR 4, 6
Elliott, D.	TR 8
Elliott, J.	TR 8
Ferguson, R.	1971/8, 1971/14; WP 49
Fitzhugh, R.	1971/2; R 62
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Frankenstein, R.	1971/24; WP 11
Frezza, D.	R 64
Fullick, M.	R 14; TR 1
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Gentile, J. R.	1972/16
Glaser, R.	1972/6, 1972/13; 1971/9; R 1, 5, 8, 11, 14, 19, 23, 24, 26, 27, 33, 38, 41, 43, 46, 52, 53, 63; WP 1, 2, 7, 12, 19, 44, 60; TR 1 5, 9
Glathe, H.	R 48; WP 48
Goldman, S.	1972/22
Goldstein, S.	1972/2; WP 52
Graham, G.	R 18; WP 6

Hawker, J. TR 1
Heathers, G. R 35; WP 18
Holland, J. 1972/14, 1972/15; 1971/4, 1971/5; R 2, 13, 20, 36, 37, 55, 64; WP 19, 50
Hsu, T. 1972/9; 1971/14
Hummel, R. R 47

Judd, W. R 52; TR 7, 9

Kaplan, J. M 2
Katsuki, D. R 62
Kaufman, B. TR 8
Kaupe, A. TR 3
Kissel, M. A. WP 46
Kjeldergaard, P. R 12, 30; WP 11
Klein, R. 1972/16
Klopfer, L. R 49, 51, 61; WP 54
Kresh, E. WP 45, 56

Lambright, J. TR 4, 6
Lesgold, A. 1972/12, 1972/17, 1972/22
Lindsey, R. 1971/17
Lindvall, C. M. 1972/11; 1971/23; R 9, 16, 28, 34, 40, 58; WP 3, 8, 61; TR 1
Lipson, J. R 17, 22; WP 5, 7, 43; TR 5
Lohnes, P. 1972/5

Magoon, J. WP 41
Maitland, A. WP 59
Mitroff, D. 1972/4
Moore, O. R 10, 15, 21, 32; WP 40

Nitko, A. 1972/1; 1971/9
Nuessle, W. 1972/8

Perfetti, C. 1972/21; 1971/17; R 45, 54
Peskowitz, N. 1971/16
Popp, H. 1972/18

Ragsdale, R. R 6; WP 9
Ramage, W. R 23; TR 5
Resnick, L. 1972/6, 1972/10, 1972/16, 1972/20; 1971/6, 1971/18, 1971/20, 1971/25; R 50, 56; WP 16, 56, 57, 58; M 2
Reynolds, J. R 14; TR 1
Reynolds, L. 1972/16
Richman, V. WP 47
Richmond, D. TR 8
Risley, T. 1971/25
Roden, A. 1972/16
Rosner, J. 1972/7; 1971/3, 1971/7, 1971/10, 1971/12, 1971/19, 1971/22; WP 47, 53

Sass, R.	1971/13
Schrag, P.	R 13
Schroeder, S.	R 36, 37, 55
Schuetz, P.	WP 57
Scott, R.	WP 47
Siegel, A.	1972/2, 1972/8, 1972/19; 1971/21; WP 45, 51, 52, 55, 56
Simon, D.	1972/3; 1971/3
Simon, H.	1972/3
Sterret, B.	WP 42
Suchman, E.	WP 14; TR 8
Thompson, F.	TR 4
Tucker, S.	1971/16
Unks, N.	WP 13
Van Cara, F.	WP 55
Vance, B.	1971/21; WP 51
Vargas, J.	R 7
Wang, M.	1971/6; R 50, 60; WP 57, 61; M 2
Weber, V.	R 51
Whittington, M.	1971/11
Wildemann, C.	M 1
Wildemann, D.	1972/14, 1972/15; 1971/4, 1971/5
Wolf, M.	1971/25
Wrobel, P.	WP 58
Yeager, J.	R 28, 33, 34, 39; WP 3, 46
Zobrak, M.	TR 2